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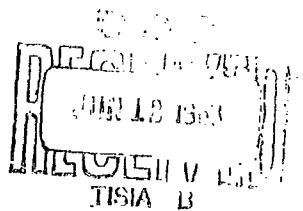
Report No. 8926-104

Material - Finishes and Coatings - Reflective Tapes -
No. 630, 633 and 3270, Minnesota Mining and
Manufacturing Co.

Reflectance Characteristics

B. H. Faulkenberry, F. M. Graber, E. E. Keller

7 May 1959



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MODEL

DATE

PAGE

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No. 630, 633 and 3270, Minnesota Mining and
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Reflectance Characteristics

Abstract

The specular reflectance of Minnesota Mining and Manufacturing Co. No. 633 gold colored D.S. Scotchcal, and No. 630 chrome colored D.S. Scotchcal films, and No. 3270 silver W/A D.S. Flat Top (R) Scotchlite reflective film was determined in the 0.35 to 2.5 micron wavelength range with a Beckman DK-2 recording spectrophotometer, and in the 1.0 to 15 micron wavelength range with a Beckman IR-4 recording spectrophotometer. Recordings of all measurements are given.

Reference: Faulkenberry, B. H., Graber, F. M., Keller, E. E.,
"Reflectance Characteristics of Reflective Tapes,"
General Dynamics/Convair Report 59-191, San Diego,
California, 7 May 1959. (Reference attached).



STRUCTURES-MATERIALS LABORATORIES

CONVAIR
A DIVISION OF GENERAL DYNAMICS CORPORATION
SAN DIEGO

REPORT MP-59-191

DATE 7 May 1959

MODEL Misc.

TITLE

REPORT NO. MP-59-191

REFLECTANCE CHARACTERISTICS
OF
REFLECTIVE TAPES

PREPARED BY B. H. Faulkner

GROUP Materials & Processes Lab.

CHECKED BY: F. M. Graber
F. M. Graber

REFERENCE.

CHECKED BY E. E. Keller
E. E. Keller

APPROVED BY E. F. Strong
E. F. Strong
Chief of Structures & Materials
In Laboratories

CULTURE ETC.

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NO. OF DIAGRAMS 12

W. B. Bullock and
W. V. Schaeffer and C. E. Felt

REVISIONS

ANALYSIS
PREPARED BY B.H. Faulkenberry
CHECKED BY F.M. Graber
REVISED BY

CONVAIR
SAN DIEGO

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MODEL MISC.
DATE 5-7-59

OBJECT:

To determine the reflectance vs. wavelength of No. 633, No. 630 and No. 3270 reflective tapes which were received from the Minnesota Mining and Manufacturing Company.

TEST SPECIMENS:

1. No. 633 Gold Colored D.S. Scotchcal Brand Film
2. No. 630 Chrome Colored D.S. Scotchcal Brand Film
3. No. 3270 Silver W/A D.S. Flat-Top (R) Scotchlite Brand Reflective Sheeting.

TEST PROCEDURE:

A Beckman DK-2 recording spectrophotometer was used to determine the diffuse and total reflectance over the range of 0.35 to 2.5 microns. The ~~Specular~~ reflectance over this range was calculated by using the following relationship:

$$\text{Total Reflectance} = \text{Diffuse Reflectance} + \frac{\text{Specular}}{\text{Specular}} \text{ Reflectance.}$$

A Beckman IR-4 spectrophotometer was used to determine the ~~Specular~~ reflectance of the three samples over the range of 1.0 to 15 microns. The specimens were maintained at room temperature for all measurements.

RESULTS:

The reflectance characteristics of the three reflective tapes are shown in Figures I through XII.

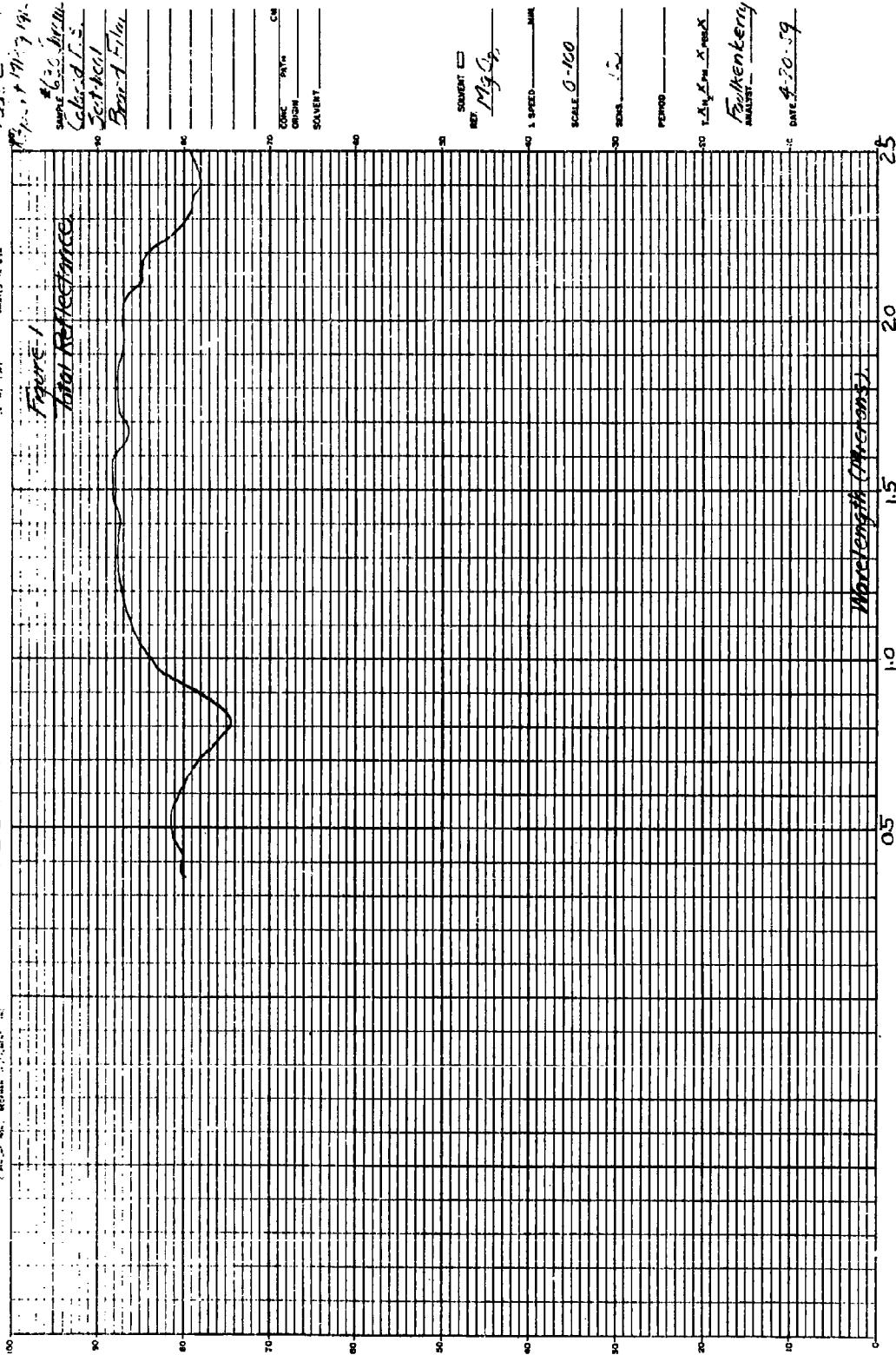
Beckman DK-2 CHART

22

1911-7-19.
same 6-2, Brachy-
calid L. S.
Set. 1911
Brachy

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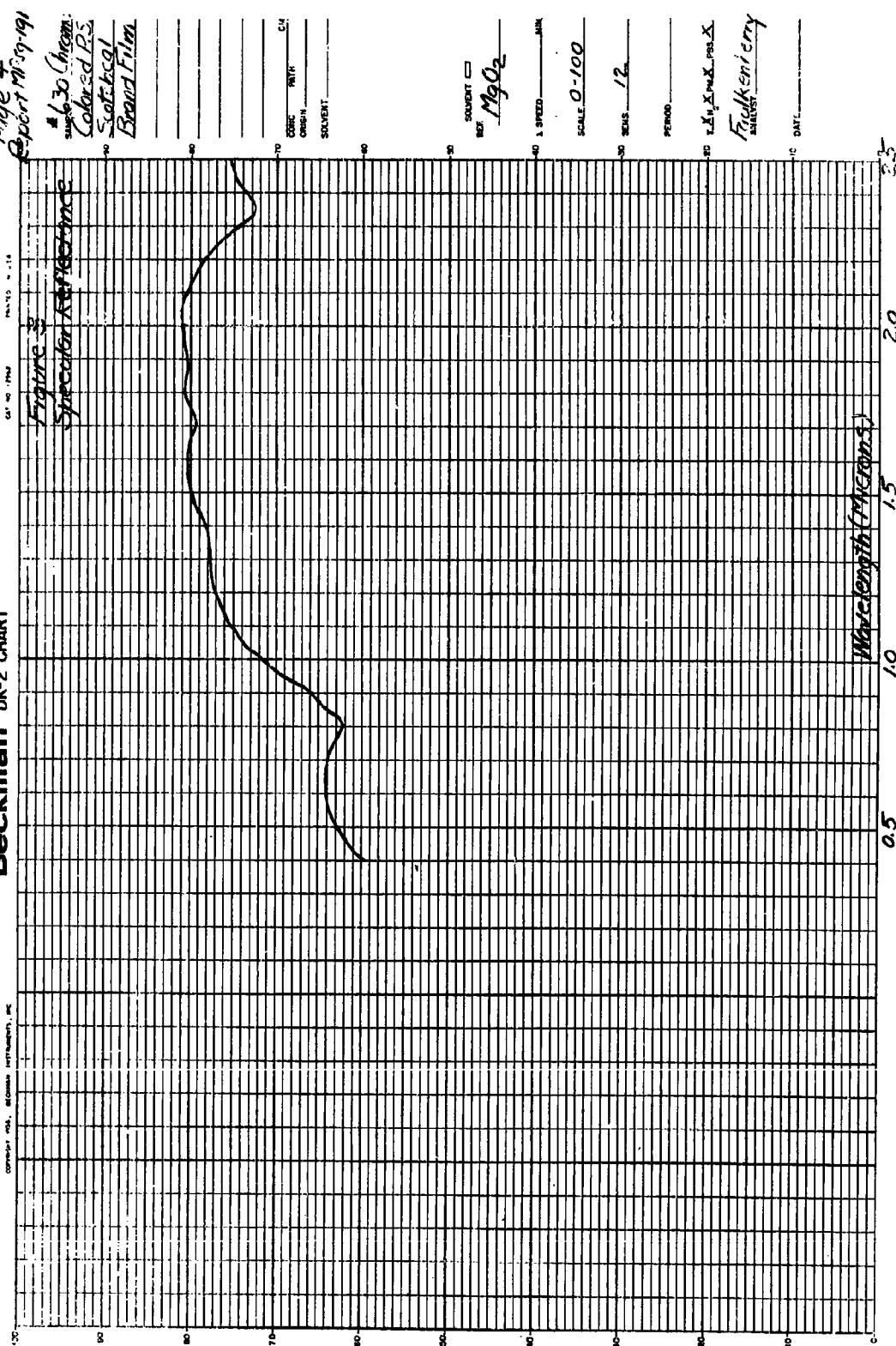
Figure 1



Beckman DK-2 CHART

Page 4
Report May 1911

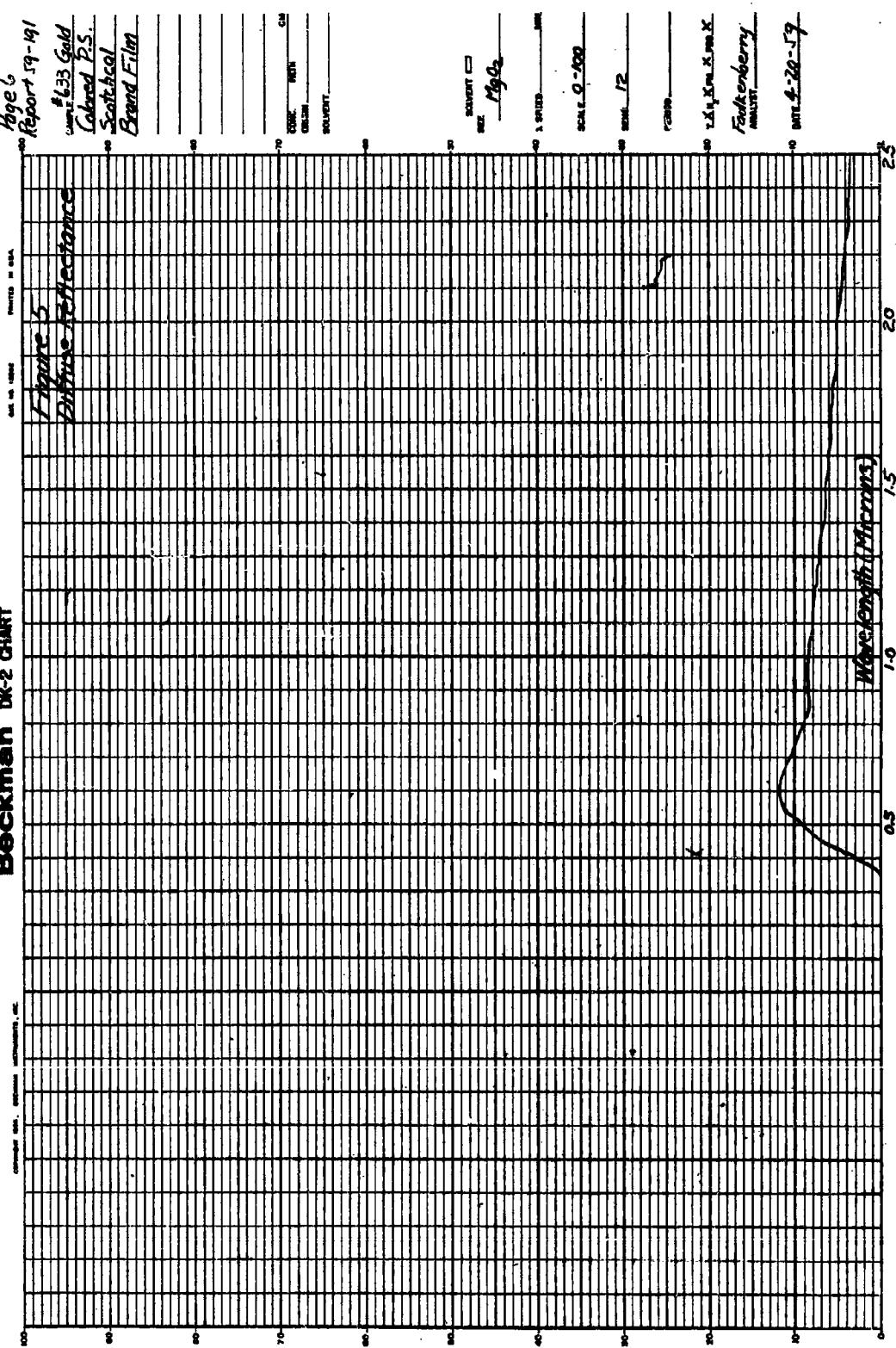
1630 Chem.
Colored P's
Scat. local
Bound Film



Beckman DK-2 CHART

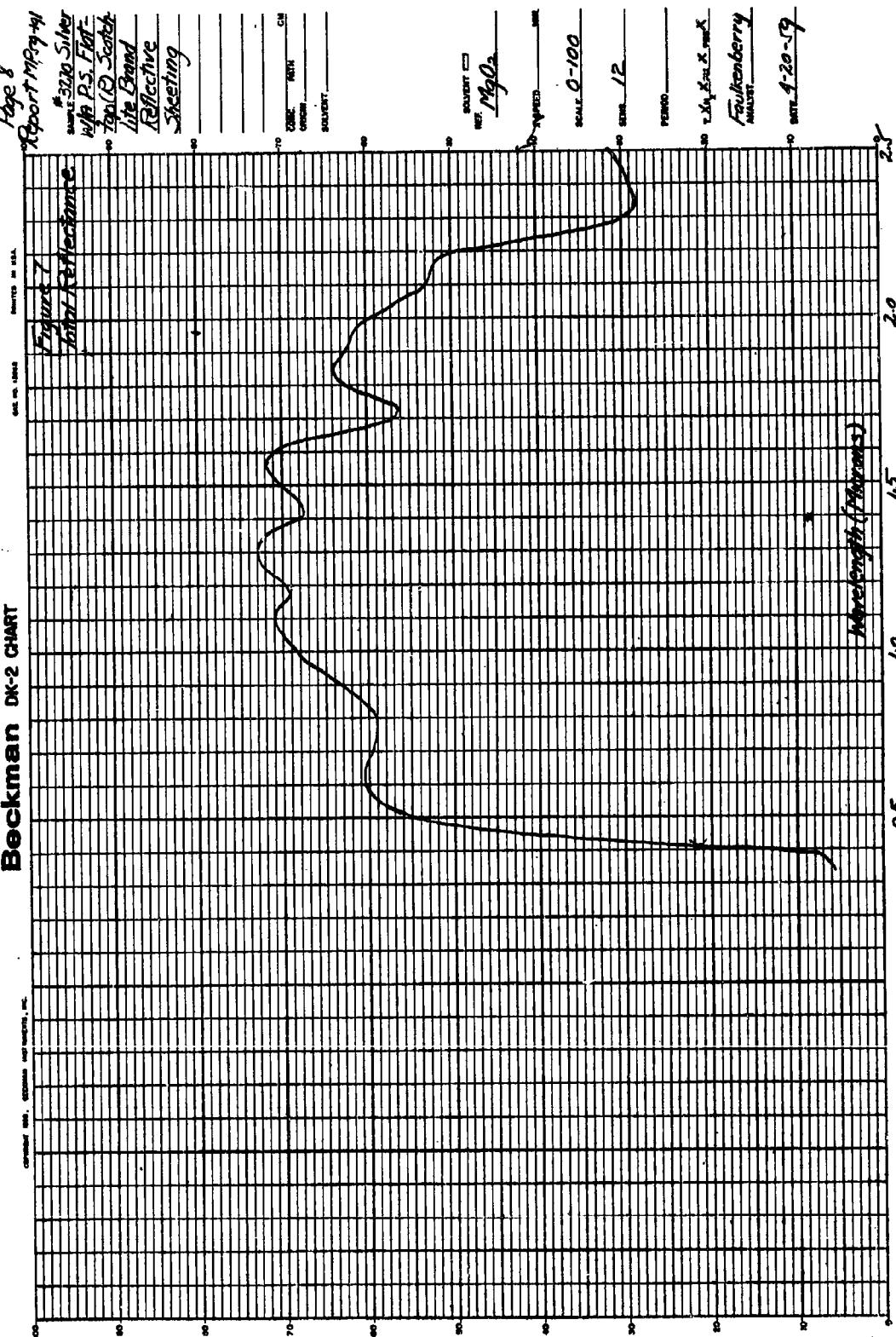
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#633 Gold
Cabred P.S.
Scotchcal
Brand Film



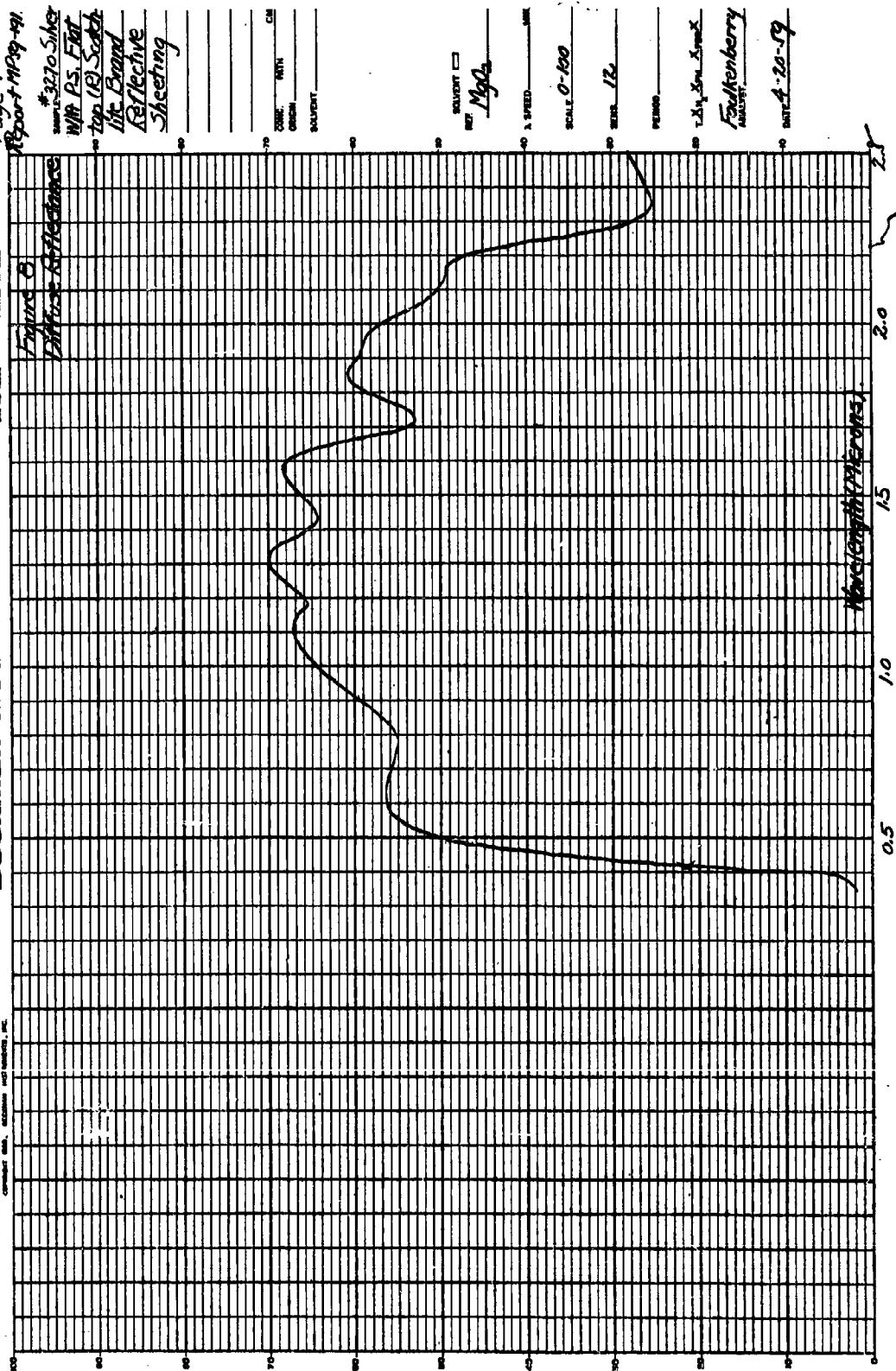
Beckman MK-2 CHART

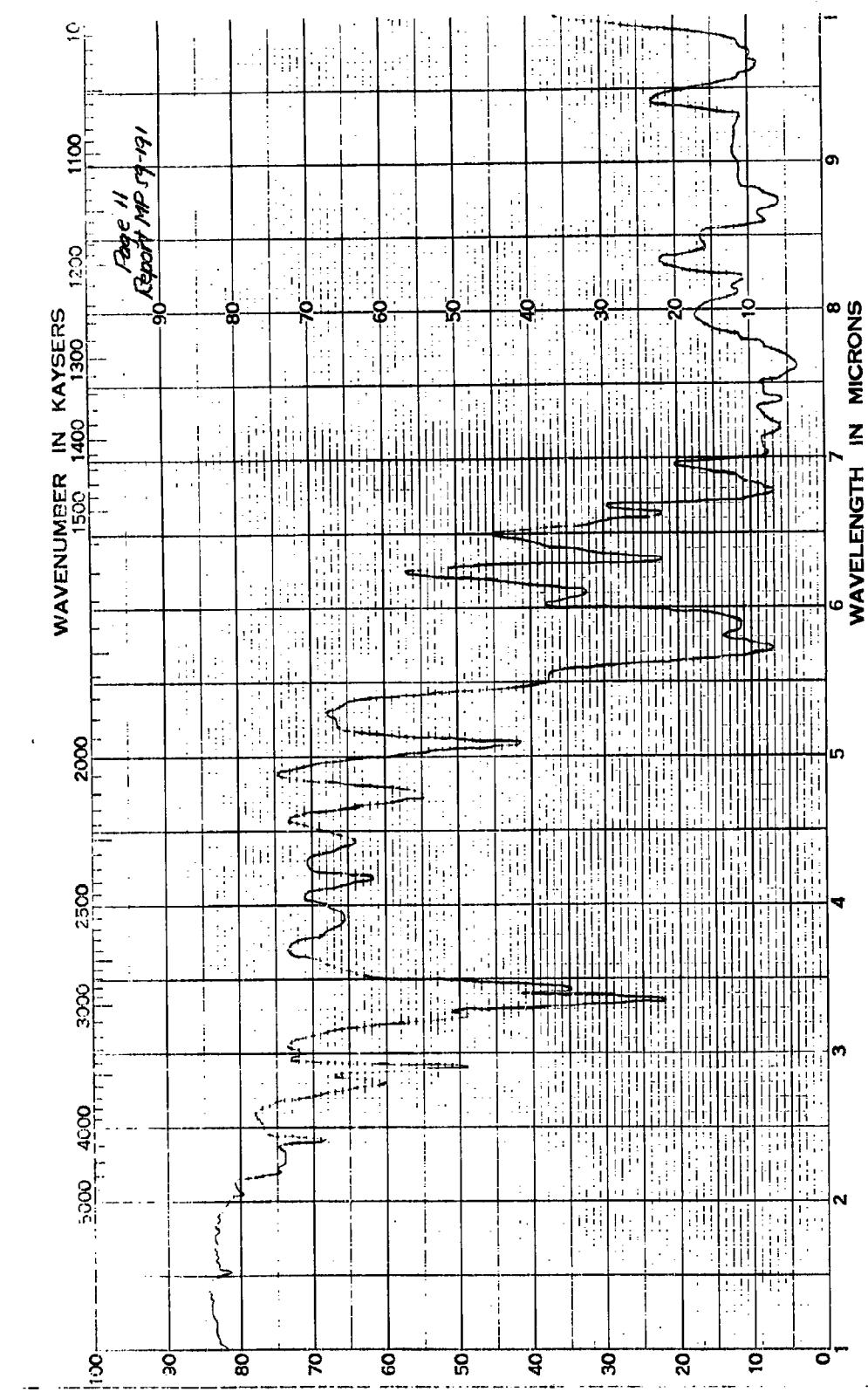
Page 8
Report 1793741
*3200 Silver
WFB P.S. Flat-
top (D) Scotch
lite Board
Reflective
Sheeting

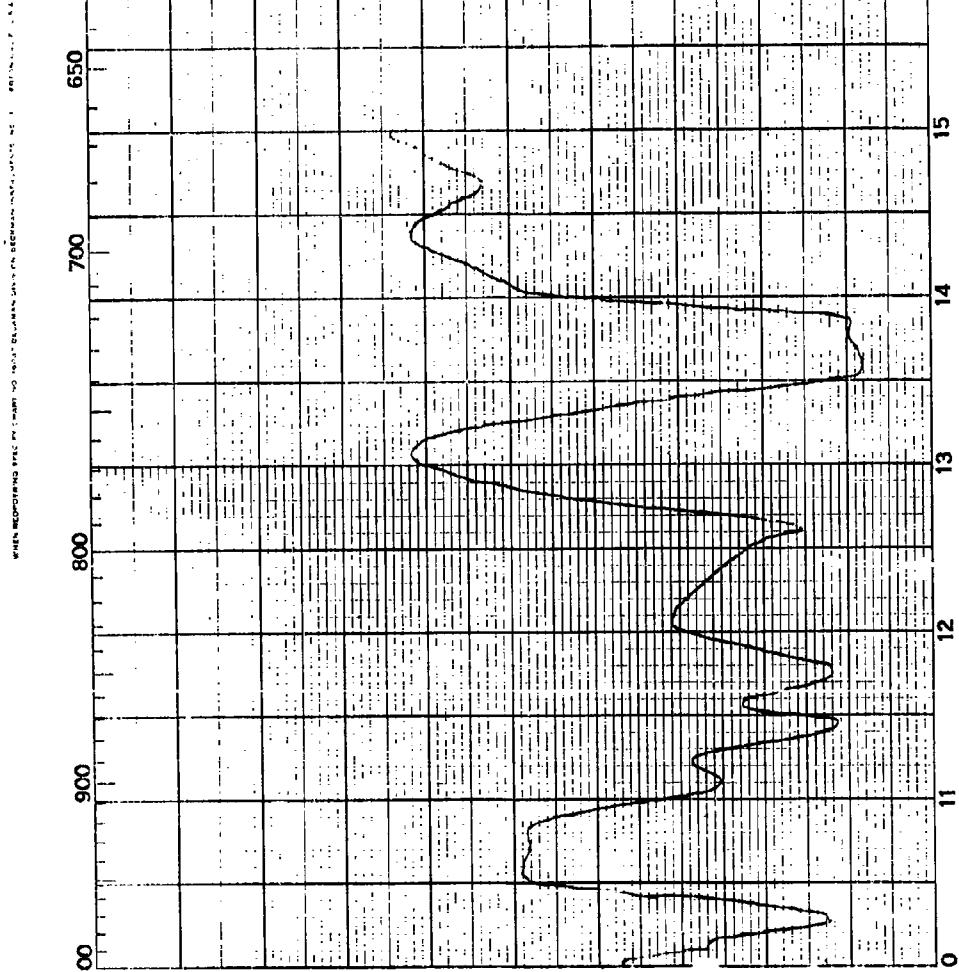


Beckman DK-2 CHART

Page 9
Report MPA9-91.
3220 Silver
WPA P.S. Fatt
top (A) Scotch
lit. Board
Self-tie
Sheeting







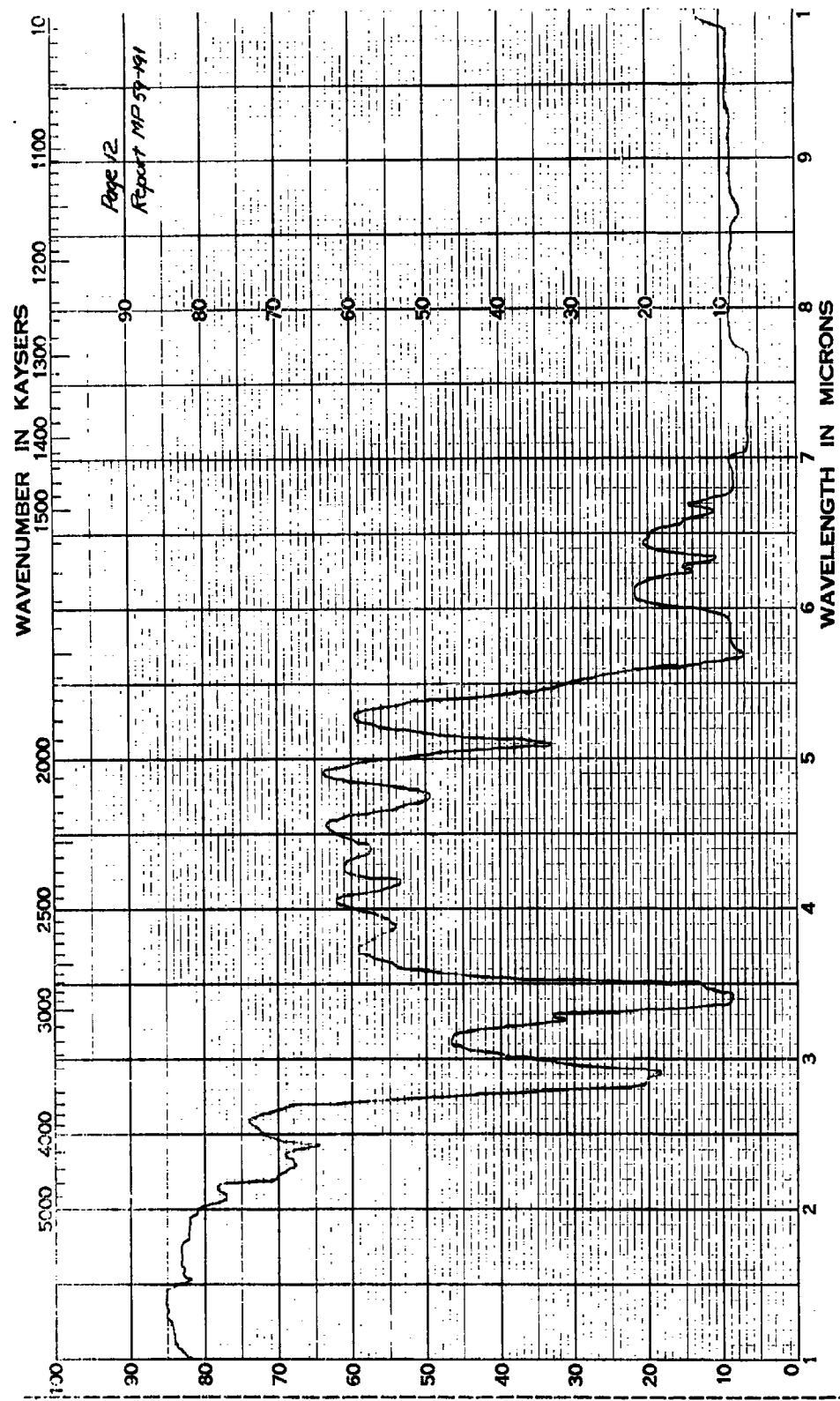
100
90
80
70
60
50
40
30
20
10
0

1630 Chromic colored PS
Scotch Brand Film

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PATH mm
SOLVENT
ORIGIN
REFERENCE
SOLVENT AIR X
SPEED 50 mm/sec.
GAIN 1.3 %
PERIOD 2 SEC.
SLIT SCHED. 10 mm
ORDINATE SCALE SP 15 mm
N.C.L. PRISM X
DATE 1-20-59
ANALYST W. K. Berry

DECKMAN
SPECTROPHOTOMETER
MODEL 1R4



אַתָּה תְּבִרְכֵנִי בְּעֵדוֹת אַתָּה בְּעֵדוֹת כָּל־עַמִּים

Figure 11
Specular Reflectance
SAMPLE #33 Gold Colored Sheet - 71
Bend Film Page 12-1
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Graph showing the relationship between the number of people per telephone and the number of telephones per person.

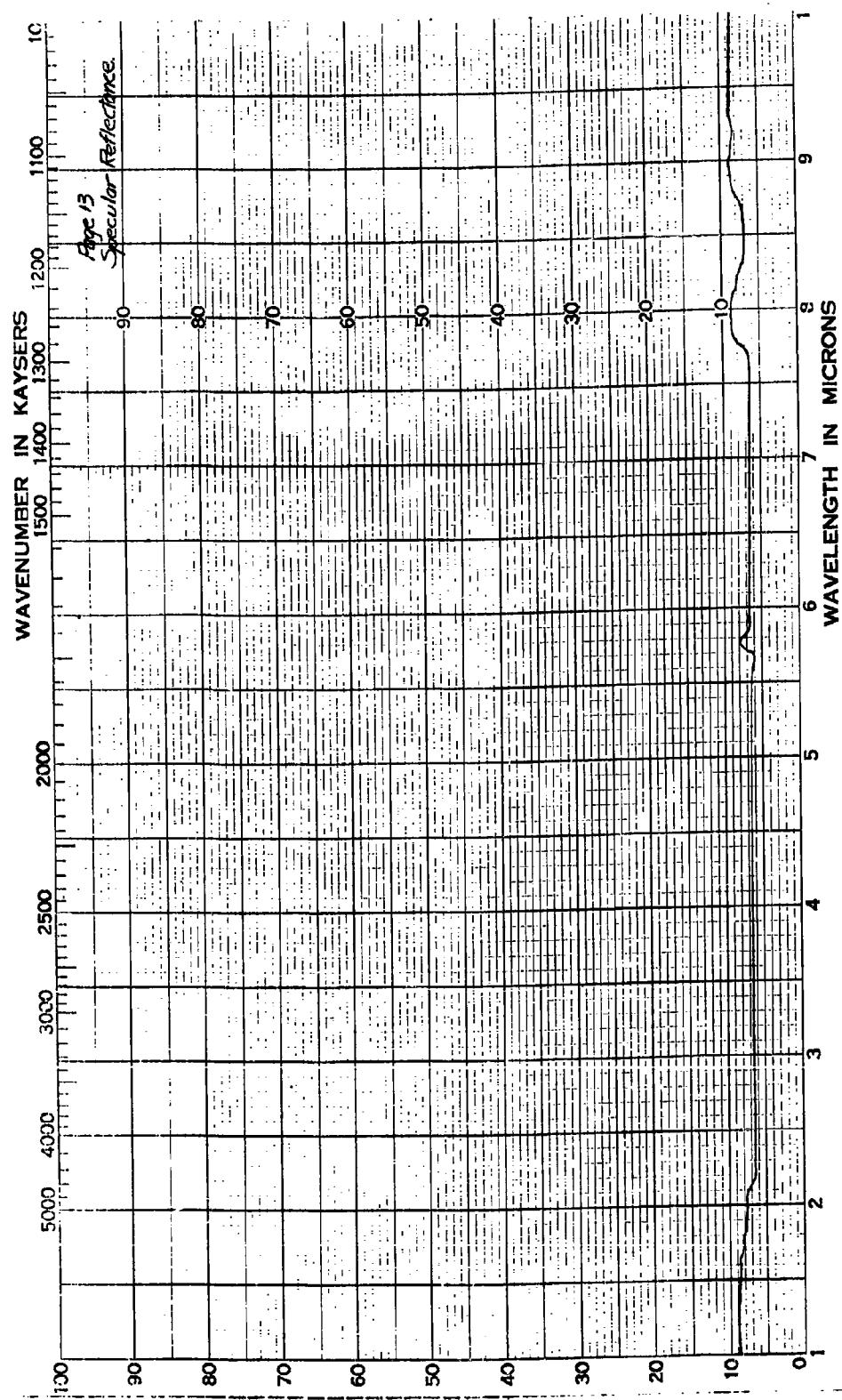
The x-axis represents the number of people per telephone, ranging from 0 to 100. The y-axis represents the number of telephones per person, ranging from 0 to 16.

Number of people per telephone	Number of telephones per person
0	16
10	1.5
25	4.5
40	2.5
55	5.5
70	3.5
90	6.5
100	8

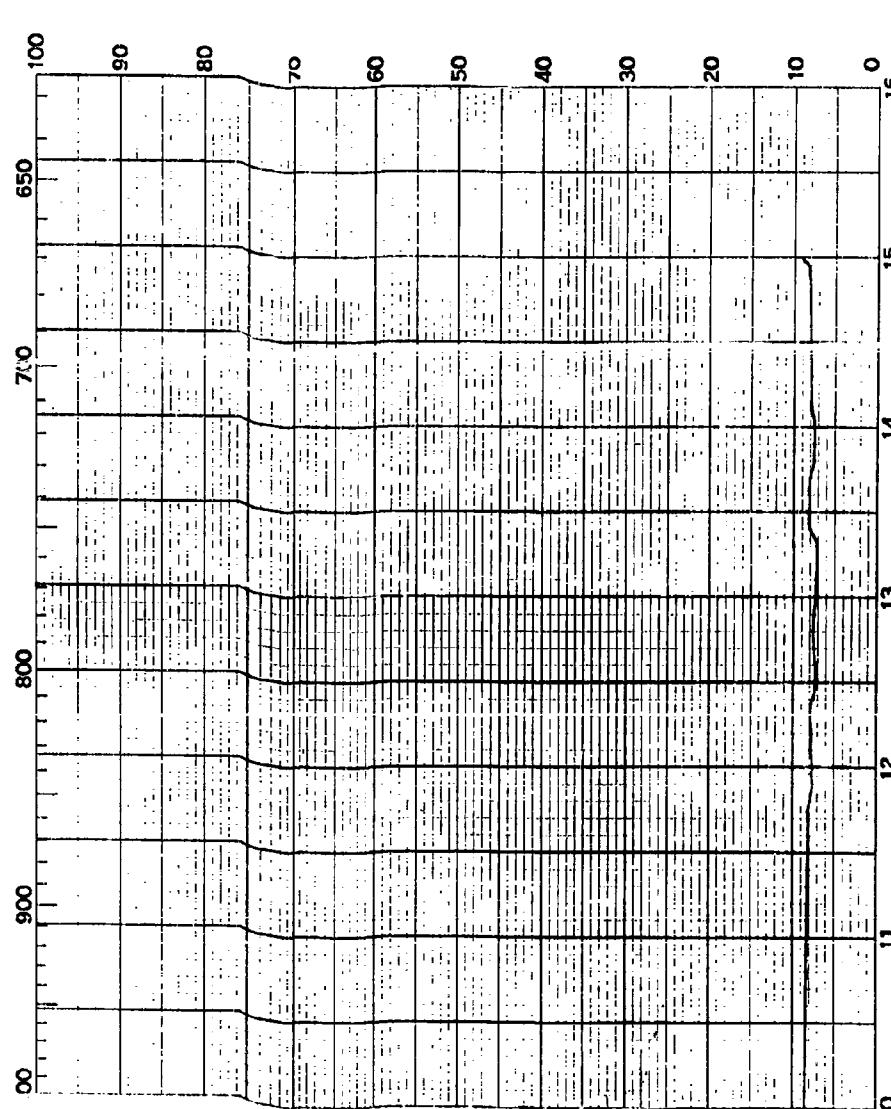
**SPECTROPHOTOMETER
MODEL 14**

MODEL 124

MOBILITY



Scotchlite Brand Reflective Sheet
SAMPLE 32270 Silver P.S. Flat Top
Specular Reflective Tape
Figure 13



SPEED 50 SYSTEM SCALE 1 in.⁴
 PERIOD 2 SLIT 1/16 in. 5mm.
 ORDINATE SCALE SB CB X
 NCI PRISM DATE 9-20-59
 ANALYST Falkenberg

**SPECTROPHOTOMETER
MODEL 111A**

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